

Appendix G

Curriculum Vitae of Robert A. Frakes, Ph.D.

CURRICULUM VITAE

Robert A. Frakes, Ph.D.

2455 Johnston Road

Fort Pierce, FL 34951

772-429-0087 (Home)

Email: frakesr@comcast.net

EDUCATION:

Ph.D. in Environmental Toxicology

Center for Environmental Toxicology and Department of Veterinary Sciences, Utah State University, Logan, UT, 1985

M.S. in Zoology (Animal Ecology)

Department of Zoology, Washington State University, Pullman, WA, 1978

B.S. in Biology

Department of Biology, University of Cincinnati, Cincinnati, OH, 1973

Graduate Training Fellowship

National Institute of Environmental Health Sciences Predoctoral Trainee in Toxicology

Utah State University, Logan, UT (1981-1985)

EXPERIENCE:

Supervisory Ecologist (2000-2014)

U.S. Fish and Wildlife Service, South Florida Ecological Services Office, Vero Beach, FL.

Developed food chain and habitat models for endangered species such as the Everglade snail kite and Florida panther. Recommended contaminant clean-up levels at Everglades restoration sites.

Developed Florida panther habitat compensation methodology. Briefly served as acting panther recovery coordinator.

Refuge Manager (1998-2000)

U.S. Fish and Wildlife Service, Florida Keys National Wildlife Refuges, Big Pine Key, FL.

Worked on conservation and management of nine endangered species in the Florida Keys, including the Key deer, American crocodile, and Lower Keys marsh rabbit.

Supervisory Fish and Wildlife Biologist (1993-1998)

U.S. Fish and Wildlife Service, New Jersey Field Office, Pleasantville, NJ.

Conducted and supervised environmental contaminant studies to assess risks to the bald eagle, peregrine falcon, and other species. Supervised the Partners for Fish and Wildlife Program.

Prepared biological opinion on New Jersey water quality standards.

State Toxicologist (1986-1993)

Maine Department of Human Services, Augusta, ME.

Primary authority in Maine state government on toxicology and chemical risk assessment for humans, fish, and wildlife. Developed dioxin standards and advisories for fish in Maine rivers.

PEER-REVIEWED PUBLICATIONS:

Leskova, O.V., R.A. Frakes and S.H. Markwith. 2022. Impacting habitat connectivity of the endangered Florida panther for the transition to utility-scale solar energy. *Journal of Applied Ecology* 00: 1–13. <https://doi.org/10.1111/1365-2664.14098>.

Frakes, R.A. and M.L. Knight. 2021. Location and extent of unoccupied panther (*Puma concolor coryi*) habitat in Florida: Opportunities for recovery. *Global Ecology and Conservation* 26 (2021) <https://doi.org/10.1016/j.gecco.2021.e01516>.

Frakes, R.A., R.C. Belden, B.E. Wood and F.E. James. 2015. Landscape analysis of adult Florida panther habitat. *PLoS ONE* 10(7): e0133044.doi:10.1371/journal.pone.0133044.

Hoang, T.C., R.L. Pryor, G.M. Rand, and R.A. Frakes. 2011. Use of butterflies as nontarget insect test species and the acute toxicity and hazard of mosquito control insecticides. *Environmental Toxicology and Chemistry* 30(4): 997-1005.

Hoang, T.C., R.L. Pryor, G.M. Rand, and R.A. Frakes. 2011. Bioaccumulation and toxicity of copper in outdoor freshwater microcosms. *Ecotoxicology and Environmental Safety* 74(4): 1011-1020.

Hoang, T.C., L.J. Schuler, E.C. Rogevich, P.M. Bachman, G.M. Rand, and R.A. Frakes. 2009. Copper release, speciation, and toxicity following multiple floodings of copper enriched agricultural soils: Implications in Everglades restoration. *Water Air Soil Pollut.* 199: 79-93.

Frakes, R.A., T.A. Bargar and E.A. Bauer. 2008. Sediment copper bioavailability to freshwater snails in south Florida: risk implications for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*). *Ecotoxicology* 17: 598-604.

Hoang, T.C., E.C. Rogevich, G.M. Rand, and R.A. Frakes. 2008. Copper uptake and depuration by Florida apple snails (*Pomacea paludosa*): Bioconcentration and bioaccumulation factors. *Ecotoxicology* 17: 605-615.

Hoang, T.C., E.C. Rogevich, G.M. Rand, P.R. Gardinali, R.A. Frakes and T.A. Bargar. 2008. Copper desorption in flooded agricultural soils and toxicity to the Florida apple snail (*Pomacea paludosa*): Implications in Everglades restoration. *Environmental Pollution* 154: 338-347.

Frakes, R.A. and L.R. Hicks. 1993. Fungicides, in: *Handbook of Hazardous Materials*, M. Corn, ed. Academic Press, Inc., San Diego, CA.

Frakes, R.A., C.Q.T. Zeeman and B. Mower. 1993. Bioaccumulation of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) by fish downstream of pulp and paper mills in Maine. *Ecotoxicology and Environmental Safety* 25: 244-252.

Frakes, R.A. 1988. Drinking water guideline for ethylenethiourea, a metabolite of ethylene bisdithiocarbamate fungicides. *Regul. Toxicol. Pharmacol.* 8: 207-218.

Frakes, R.A., R.P. Sharma, C.C. Willhite and G. Gomez. 1986. Effect of cyanogenic glycosides and protein content in cassava diets on hamster prenatal development. *Fundam. Appl. Toxicol.* 7: 191-198.

Frakes, R.A., R.P. Sharma and C.C. Willhite. 1986. Comparative metabolism of linamarin and amygdalin in hamsters. *Food and Chemical Toxicology* 24: 417-420.

Frakes, R.A., C.C. Willhite and R.P. Sharma. 1985. Developmental toxicity of the cyanogenic glycoside linamarin in the golden hamster. *Teratology* 31: 241-246.

Willhite, C.C., N.L. Rossi, R.A. Frakes and R.P. Sharma. 1985. Cranioschisis aperta with encephaloschisis in cephalothoracopagus hamster twins. *Can. J. Comp. Med.* 49: 195-201.

Taylor, M.J., R.A. Frakes, R.P. Sharma and C.C. Willhite. 1984. Comparative pharmacokinetics of trypan blue in female Sprague-Dawley and Long-Evans rats. *Food and Chemical Toxicology* 22(11): 875-878.

Frakes, R.A. and R.E. Johnson. 1982. Niche convergence in *Empidonax* flycatchers. *Condor* 84: 286-291.

TECHNICAL REPORTS:

Frakes, R.A. 2018. Impacts to panther habitat from the proposed Eastern Collier Multiple Species Habitat Conservation Plan: a quantitative analysis. Report prepared for the Conservancy of Southwest Florida, October 2018.

Frakes, R.A., T.A. Bargar, B. Arrington, J.F. Boggs, J. Tutton, and A. Sowers. 2010. Pesticide and nutrient contamination in the Cypress Swamp of the A.R.M. Loxahatchee National Wildlife Refuge. U.S. Fish and Wildlife Service, Vero Beach, FL. July 2010.

Frakes, R.A., T.A. Bargar, B. Arrington, J.F. Boggs, J. Tutton, and A. Sowers. 2010. Pesticide and nutrient contamination in the Strazulla Marsh of the A.R.M. Loxahatchee National Wildlife Refuge. U.S. Fish and Wildlife Service, Vero Beach, FL. July 2010.

Frakes, R.A., E.A. Boughner, J.F. Boggs, J. Tutton, and T.A. Bargar. 2007. Delineation of the nature and extent of contamination at the former NAS Key West Skeet Club on Great White Heron National Wildlife Refuge. U.S. Fish and Wildlife Service, Vero Beach, FL. October 2007.

Bargar, T.A., R.A. Frakes, J.F. Boggs, and E.A. Boughner. 2005. Uptake of copper by apple snails from contaminated sediments in south Florida. Interim report. U.S. Fish and Wildlife Service, Vero Beach, FL. January 2005.

Frakes, R.A. 2004. Ecological risk assessment guidance for wetland restoration on agricultural lands in south Florida. U.S. Fish and Wildlife Service, Vero Beach, FL. August 2004.

Frakes, R.A. 2000. McMurrain Farms ecological risk assessment, summary and recommendations. U.S. Fish and Wildlife Service, Vero Beach, FL. November 2000.

Frakes, R.A. 2000. Derivation of "No-Application Periods" for interim use pesticides. U.S. Fish and Wildlife Service, Vero Beach, FL. April 2000.

USFWS. 1999. Evaluation of contaminant residues in Delaware Bay bald eagle nestlings, 1996-98. U.S. Fish and Wildlife Service, Pleasantville, NJ. January 1999.

Frakes, R.A. 1998. Preliminary contaminants survey, Naval Air Station Key West Skeet Club. U.S. Fish and Wildlife Service, Big Pine Key, FL. October 1998.

USFWS. 1998. Metals in New Jersey's Pinelands National Reserve sediments, surface water and biota: an emphasis on mercury. U.S. Fish and Wildlife Service, Pleasantville, NJ. April 1998.

USFWS and NJDEP. 1998. Reproductive success and egg contaminant concentrations of southern New Jersey peregrine falcons. U.S. Fish and Wildlife Service, Pleasantville, NJ. March 1998.

USFWS. 1996. Biological opinion on the effects of the U.S. Environmental Protection Agency's approval of the State of New Jersey's Surface Water Quality Standards on the bald eagle, peregrine falcon, and dwarf wedgemussel. U.S. Fish and Wildlife Service, Pleasantville, NJ. June, 1996.

USFWS. 1996. Environmental contaminants impact analysis and ecological risk assessment for the Federal Aviation Administration Technical Center CERCLA sites in Atlantic County, New Jersey. U.S. Fish and Wildlife Service, Pleasantville, NJ. April 1996. (study director).

USFWS and NJDEP. 1995. Evaluation of contaminant residues in Delaware Bay bald eagle nestlings. U.S. Fish and Wildlife Service, Pleasantville, NJ. October 1995. (study director).

USFWS. 1994. Evaluation of contaminants in sediments and forage organisms, Cape May National Wildlife Refuge. Technical assistance report. U.S. Fish and Wildlife Service, Pleasantville, NJ. August 1994. (study director).

Frakes, R.A. 1990. Health-based water quality criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Maine Department of Human Services, Augusta, ME. November 1990.

Frakes, R.A. 1989. Risk assessment of uncontrolled ash releases from the Maine Energy Recovery Company (MERC) in Biddeford, Maine. Maine Department of Human Services, Augusta, ME. January 1989.

Frakes, R.A. 1987. Maximum Exposure Guideline for ethylenethiourea in drinking water. Maine Department of Human Services, Augusta, ME.

Frakes, R.A. 1987. Risk assessment for dioxin-contaminated fish. Maine Department of Human Services, Augusta, ME. February 1987.

Frakes, R.A. 1986. Health risks associated with land-spreading of dioxin-contaminated sludge. Maine Department of Human Services, Augusta, ME. June 1986.

SELECTED TRAINING

Spatial Distribution, Animal Movement and Home Range Analysis. National Conservation Training Center, US Fish and Wildlife Service, Shepherdstown, WV (2012).

Data Analysis IIIB: Species Distribution Modeling Using R (40 hrs). National Conservation Training Center, US Fish and Wildlife Service, Panama City, FL (December 2009).

Data Analysis IIIA: Species Distribution Modeling Using R (40 hrs). National Conservation Training Center, US Fish and Wildlife Service, Panama City, FL (August 2009).

Data Analysis II. Ecological Modeling Using R (40 hrs). National Conservation Training Center, US Fish and Wildlife Service, Panama City, FL (July 2009).

GIS Introduction for Conservation Professionals. National Conservation Training Center, US Fish and Wildlife Service, Vero Beach, FL (2008).

Geostatistical Analysis of Environmental Data. University of Florida, Gainesville, FL (2006).

Migratory Bird Conservation – A Trust Responsibility. National Conservation Training Center, US Fish and Wildlife Service. Taught at Vero Beach, FL, February 5-8, 2007.

Hazardous Waste Operations and Emergency Response (40-hour). Center for Safety and Environmental Management, Slippery Rock University. Taught at Vero Beach, FL, May 1-4, 2006.

Endangered Species Act - Section 7 Training: Level 1. U.S. Fish and Wildlife Service, Vero Beach, FL (2003).

National Environmental Contaminants Training Conference. Division of Environmental Quality, U.S. Fish and Wildlife Service, Tucson, AR (2003).

National Environmental Contaminants Training Conference. Division of Environmental Quality, US Fish and Wildlife Service, Fish Camp, CA (2001).

National Environmental Contaminants Training Conference. Division of Environmental Contaminants, US Fish and Wildlife Service, Branson, MO (1999).

Cold Weather Oil Spill Response. US Coast Guard, Portland, ME (1996).

Oiled Wildlife Recovery, Reception, and Response. Tri-State Bird Rescue and Research, Sudbury, MA (1996).

Natural Resource Damage Assessment. National Conservation Training Center, US Fish and Wildlife Service, Tacoma, WA (1995).

Mid-America Toxicology Course. Kansas City, MO (1992).